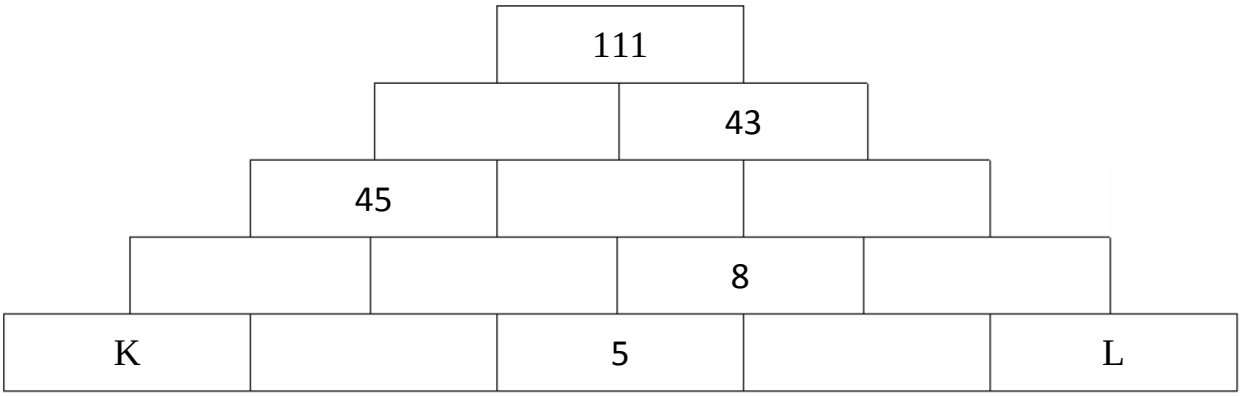
Peter's Problem 2021 -Suggested Solutions

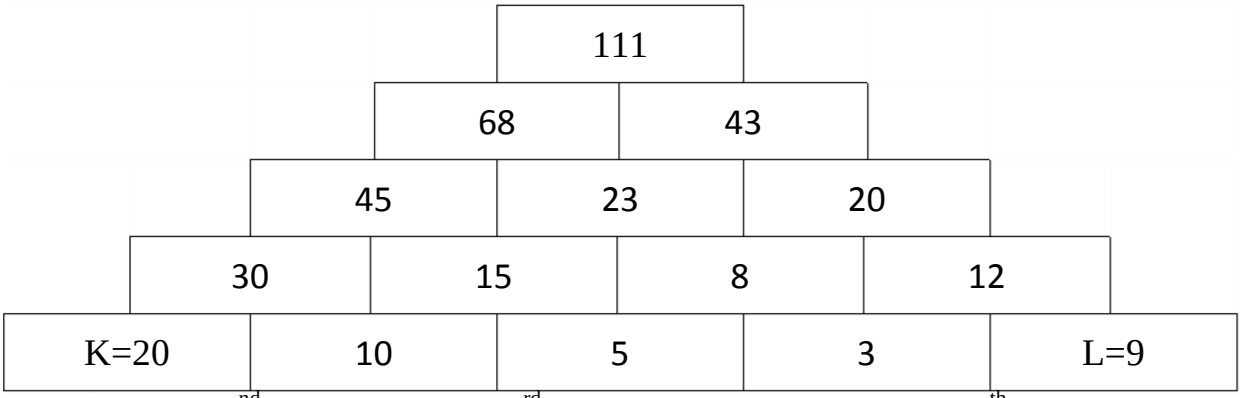
Problem No. 1

In the pyramid, each rectangle is to be filled with the sum of the two numbers immediately below it.



What is the value of K+L?

Solution to No. 1



By subtraction: 2nd row: 111-43 = 68. 3rd row: 68 – 45 = 23; 43 – 23 = 20. 4th row: 20 – 8 = 12; 23 – 8 = 15; 45 – 15 = 30. 5th row: 15 – 5 = 10; 30 – 10 = 20 = K; 8 – 5 = 3; 12 – 3 = 9 = L.

K + L = 20 + 9 = 29.

Answer: K+L = 29

Problem No. 2

Insert one of the words 'seven', 'eight', 'nine', 'ten', or 'eleven' into this sentence to make it true

The letter 'e' appears _____times in this sentence.

Solution to No. 2

The letter 'e' appears ten times in this sentence.

By counting we see that the correct word to insert is 'ten' since there are 9 other 'e's and the word 'ten' adds one more to give a total of 10 letters 'e'. Answer: TEN

Problem No. 3

Imagine you are in a queue to the airport check-in desk. If two thirds of the queue is in front of you and three tenths of the queue is behind you, how many people are in the queue?

Solution to No. 3

Let the number in the queue be x. Then $\frac{2}{3}x + 1 + \frac{3}{10}x = x$. Therefore $20x + 30 + 9x = 30x$ which implies $x = 30$.

Alternative solution:

The fractions of thirds and tenths have a common denominator of thirtieths. Converting to thirtieths we have $\frac{2}{3} = \frac{20}{30}$ and $\frac{3}{10} = \frac{9}{30}$. Then $\frac{20}{30} + \frac{9}{30} = \frac{29}{30}$. There is one person remaining in the queue which is you which corresponds to the remaining fraction of $\frac{1}{30}$ of the queue. Therefore, there are 30 people in the queue. Answer: 30

Problem No. 4

Any whole number containing 3 or more digits can be divided by 4 if the last two digits form a number that is divisible by 4. Why?

Solution to No. 4

- Any number which has 3 or more digits (a non-zero leading digit is implied), say 'a…cde', may be split into two parts – the hundreds part and the final two digits part and written as a sum, say 'a…c00 + de'.
- The hundreds part, 'a…c00', is divisible by 4 since it is a multiple of 100 and 100 is divisible by 4.
- The 2-digit number, 'de', is divisible by 4 as given.
- Therefore the combined original whole number is divisible by 4.

Problem No. 5

What is the smallest number of integer kilogram weights needed to weigh every whole kilogram between 1kg and 40kg inclusive?

Solution to No. 5

Four weights are required together with a balance. These are 1kg, 3kg, 9kg, 27kg.
Let W indicate the item to be weighed, e.g. **W1** is an item which weighs 1kg and '=' indicates the balance and 1, 3, 9, 27 are the known weights.

W1 = 1	**W9** = 9	**W17**+9+1=27	**W25**+3=27+1	**W33**+3=27+9
W2 + 1 = 3	**W10** = 9+1	**W18**+9=27	**W26**+1=27	**W34**+3=27+9+1
W3 = 3	**W11**+1 = 9+3	**W19**+9=27+1	**W27**=27	**W35**=+1=27+9
W4 = 3+1	**W12** = 9+3	**W20**+9+1=27+3	**W28**=27+1	**W36**=27+9
W5+3+1 = 9	**W13**= 9+3+1	**W21**+9=27+3	**W29**+1=27+3	**W37**=27+9+1
W6+3 = 9	**W14**+9+3+1=27	**W22**+9=27+3+1	**W30**=27+3	**W38**+1=27+9+3
W7 + 3 = 9+1	**W15**+9+3=27	**W23**+3+1=27	**W31**=27+3+1	**W39**=27+9+3
W8+1 = 9	**W16**+9+3=27+1	**W24**+3=27	**W32**+3+1=27+9	**W40**=27+9+3+1

Problem No. 6

The scale on a map of Ireland is 1:2 000 000.
How many square centimetres are represented on the map by the province of Munster, correct to the nearest square centimetre?

Solution to No. 6

2 000 000 cm = 20km. 1cm represents 20km. So $1cm^2$ represents 20^2km^2 which is $400km^2$.
From https://en.wikipedia.org/wiki/Munster the area of Munster is 24,675 km^2.
$\frac{24675}{400} = 61.6875 = 62$ correct to the nearest square cm.
Answer: 62 square centimetres.

Problem No. 7

Find the values of a, b, c and d such that the 4-digit number

abcd × 4 = dcba

Solution to No. 7

- $a \neq 0 \Rightarrow d \neq 0$.
- $4a$+(carry of 0, 1, 2 or 3) $= d$ and cannot be > 9. Therefore, a = 1 or 2.
- $a = 4d \Rightarrow a$ is even. Therefore, ***a* = 2**.
- $a = 2 \Rightarrow$ d= 8 or 9. Since 4(9) = 36 and 4(8) = 32 gives final digit of 2, we have ***d* = 8**.
- Since $4a$ + (carry of 0 from $4b$) = d therefore b = 0, 1 or 2.
- $4d$ = 4(8) gives a carry of 3, therefore $4c$+3 = b must be odd. Therefore, ***b* = 1**.
- Then $4c$ + 3 = 11, 21 or 31 => $4c$ = 8, 18 or 28 => c = 2 or 7.
- Testing c = 2 gives 4(2128) = 8512, incorrect for reversal of digits.
- Testing ***c* = 7** gives 4(2178) = 8712 correct reversal of digits, as required.
- Answer: abcd = 2178 or a = 2, b = 1, c = 7, d = 8.

Problem No. 8

What is the largest 3 digit number that can be divided evenly by 6, 7 and 8?

Solution to No. 8

The LCM of 6, 7, 8 is 2.2.2.3.7 = 168. Since 6(168) = 1008, 5(168) = 840 is the largest 3-digit number divisible by 6, 7 and 8.
Answer: 840

Problem No. 9

Use each of the given numbers only once combined with any mathematical symbol to give a total to 439.
Given numbers: 50, 25, 9, 1, 4, 7

Solution to No. 9

Any valid solution. Example: 9(50 + 4 – 1 – 7) + 25 = 439.

Problem No. 10

Five couples attend a dinner party. Each person shakes hands with each of the other people but not with their own partner.

How many handshakes are made?

Solution to No. 10

Ten people at the party. In 1st couple each person shakes 8 other hands;
In 2nd couple each person shakes 6 other hands;
In 3rd couple each person shakes 4 other hands;
In 4th couple each person shakes 2 other hands;
Each person in the 5th couple has already greeted everybody.
Total number of handshakes = 2(8) + 2(6) + 2(4) + 2(2) = 40.

Problem No. 11

A Garda is chasing a thief on foot. The thief has a 27 step head-start and takes 8 steps to the Garda's 5. However, the Garda's stride is longer and two of the Garda's steps equals five of the thief's. How many steps does the Garda take in order to catch the thief?

Solution to No. 11

Let the Garda's steps measure 40cm and the thief's steps measure 16cm. i.e., two Garda steps = 80cm = five of the thief's steps.
In a k-second interval the Garda takes 5 steps and the thief takes 8 steps. The Garda travels 5×40 = 200cm and the thief travels 8×16 = 128cm. The Garda gains 200-128 = 72cm in this time.
The thief has a headstart of 27×16 = 432cm.
The Garda catches up on this in $\frac{432}{72} = 6$ of the k-second intervals. Since the Garda takes 5 steps in each interval, altogether the Garda takes 5×6= 30 steps to catch the thief.

Alternative solution:

Equal distances: In steps: Garda 2 = Thief 5; Garda 1 = Thief 2.5; Garda 5 = Thief 12.5
Every time the thief goes forward 8 steps the Garda goes forward 5 steps or 12.5 thief-steps. We have the sequences: Thief: 27, 35, 43, 51, 59, 67, 75.
Garda: 12.5, 25, 37.5, 50, 62.5, 75.
At this stage they meet. This is 6 groups of 5 steps = 30 steps for the Garda.

Alternative solution:

Suppose that the thief takes steps of length 1m in a time of 1 second. The Garda takes steps of $\frac{5}{2}$m but only $\frac{5}{8}$ of a step per second. Therefore, the Garda travels at $\frac{5}{8}.\frac{5}{2}$m per sec = $\frac{25}{16}$m/sec.
The Garda gains by $\frac{25}{16} - 1 = \frac{9}{16}$ m/sec or per step the thief takes. The Garda will catch the thief when the initial gain of 27 steps is eliminated.
This takes $\frac{27}{\frac{9}{16}} = 3(16) = 48$ seconds or 48 thief-steps. Thus, the Garda takes $\frac{5}{8}(48) = 30$ steps.

Alternative solution:

Let the thief take *x* more steps. In the same time the Garda will take $\frac{5}{8}x$ steps. But the Garda will cover a distance of $\frac{5}{2}.\frac{5}{8}x$ which is $\frac{25}{16}x$. The thief is caught when the distances travelled are equal.
So, solve $27 + x = \frac{25}{16}x$. We get *x* = 48. The thief takes 48 more steps. The Garda takes $\frac{5}{8}(48) = 30$ steps. Answer: 30 steps

Problem No. 12

There is a string of 33 pearls worth €65 000. The biggest and most expensive pearl is in the central spot. The cheapest pearls are at the ends. From one end the value of the pearls increases by €100, uniformly, up to and including the largest pearl; from the other end, they increase in value by €150 each, up to and including the big pearl.

What is the value of the big pearl?

Solution to No. 12

Let x (in euro) be the value of the big pearl. Then there are 16 smaller pearls whose values are $(x-100), (x-200), \ldots (x-1600)$ and 16 other smaller pearls whose values are $(x-150), (x-2(150)), \ldots (x-16(150))$.

The total value of all the pearls is the sum of the values which is €65000.

$$(x-100) + (x-200) + \ldots + (x-1600) + x + (x-150) + (x-2(150)) + \ldots + (x-16(15)) = 65000$$

$$16x + x + 16x - 100(1 + 2 + \ldots + 16) - 150(1 + 2 + \ldots + 16) = 65000$$

$$33x - 250(136) = 65000$$

$$33x = 99\,000$$

$$x = 3000$$

Answer: The value of the big pearl is €3000. Note: The smallest pearls on each side have values €1400 and €600.

Problem No. 13

The diagram below shows the odometer reading above the trip meter reading on a car. The odometer cannot be changed while the trip meter may be reset at any time. When either meter shows all 9s, the next number shown is all 0s.

The diagram shows the first 4 digits of each meter are the same.

Odometer	12345.6
Trip meter	123.4

Assuming that the trip meter has not been reset, how far has the car travelled when the first 4 digits are again the same on both meters?

Solution to No. 13

Small changes to the decimal, unit, tens and hundreds places will change all the numbers on the trip-meter but not the first two numbers of the odometer. Thus, the numbers cannot match again until at least (1000-123.4) = 876.6km have been travelled and the trip-meter is reset to 000.0.

At this stage the odometer will be at 12345.6 + 876.6 = 13222.2.

A further 130km is required to bring the first two digits of the trip-meter in line with the odometer. The odometer will read 13352.2 and the trip-meter 130.0. A further 3.5km will align the four digits again. The total travelled is 876.6 + 130 + 3.5 = 1010.1km

Answer: 1010.1km

Problem No. 14

19, 4, 15, 11 are the first four terms of sequence of numbers where each term is the difference between the previous two terms.

(i) What is the 2021st term?

(ii) What is the sum of the first 2021 terms?

Solution to No. 14

The sequence is 19, 4, 15, 11, 4, 7, 3, 4, 1, 3, 2, 1, 1, 0, 1, 1, 0, …

After 11 terms the sequence settles into a pattern of three terms 1, 1, 0.

2021 – 11 = 2010.

2010 ÷ 3 = 670 with no remainder. There are 670 sets of the (1, 1, 0) sub-sequence. Thus, the 2021st term will correspond with the 3rd term of the sub-sequence 1, 1, 0 and must be 0.

Answer (i) 0

There are 670 sub-sequences of 1, 1, 0. Thus, the sum of the terms is 19 + 4 + 15 + 11 + 4 + 7 + 3 + 4 +1 + 3 + 2 + 670(1 + 1 + 0) = 73 + 1340 = 1413

Answer (ii) 1413

Problem No. 15

In a cipher code (using a Caesar shift-cipher) the numbers 0 to 25 are assigned to the letters from A to Z respectively. I received a coded message where 3 has been added to the number assigned to the letter in the message.

The message I received was

L W V V
L A W L
P H V V
H Y H Q

What number may be found from the message written in this code?

Solution to No. 15

A, B, C, D, E, F, G, H, I, J, K, L, M , N, O, P, Q, R, S, T, U, V, W, X, Y, Z
0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20 , 21, 22, 23, 24, 25.

To reverse the code we must subtract 3 from the number associated with the letter in the message. If the result is negative we must add 26 in order to keep the result within the correct range 0 – 25.

Code letter	L	W	V	V		L	A	W	L		P	H	V	V		H	Y	H	Q
Code number	11	22	21	21		11	0	22	11		15	7	21	21		7	24	7	16
Subtract 3	8	19	18	18		8	-3+26 =23	19	8		12	4	18	18		4	21	4	13
Message letter	I	T	S	S		I	X	T	I		M	E	S	S		E	V	E	N
Message	ITS SIX TIMES SEVEN																		

The number found from this message is 42.

Answer: 42

Problem No. 16

Imagine a wire lies tightly around the equatorial circumference of the moon. The length of the wire is increased by 1 metre and raised by an equal amount all around the equator.
Which of the following is the largest ball that would fit under the longer wire – a golf ball, a sliotar, a football or a basketball?

Solution to No. 16

Let the radius of the moon be R metres. The circumference is 2πR. This is increased by 1m. The wire now forms a circle with circumference 2πR+1. The radius of this circle is $\frac{2\pi R+1}{2\pi} = R + \frac{1}{2\pi} = R + 0.15916$ metres. Thus the wire has been uniformly lifted by almost 16cm.
The diameter of a golf ball is approximately 4.3cm
The diameter of a sliotar is approximately 7cm
The diameter of a football (GAA) is approximately 22cm
The diameter of a football (soccer) is approximately 22cm
The diameter of a basketball is approximately 24cm (full size) or 22cm (youth size)

Answer: Thus, the largest ball which would fit under the longer wire is the **sliotar**.

Alternative solution:

The circumference of the moon is 10917km or 10917000m. Let r be the radius of the moon. $r = \frac{10917000}{2\pi} = 1737494.514$m. The wire is increased to the length 10917001m. Let the radius of the larger circle created by this wire be R. Then $R = \frac{10917001}{2\pi} = 1737494.673$m.
The difference in the radii is *R-r* = 1737494.673-1737494.514 = 0.159m or 15.9cm.
Answer: The **sliotar** is the largest ball which will fit under the rope.

Problem No. 17

N is a positive whole number such that 3N has exactly 5 positive factors including itself and 1. How many factors does 5N have?

Solution **to No. 17**

A prime p has 2 factors which are 1 and p. Each successive power of p increases the number of factors by 1. Thus, p^2 has 3 factors: 1, p, p^2; and p^3 has 4 factors; p^4 has 5 factors; etc.

A composite number which is not the power of a single prime has more than one prime factor and cannot have 5 factors. So, a number composed of two primes, p_1 and p_2, has 4 factors 1, p_1, p_2 and $(p_1.p_2)$. Introducing a minimum of one extra power of say, p_1, gives a composite number with 6 factors: 1, p_1, p_2, p_1^2, $(p_1.p_2)$ and $(p_1^2.p_2)$. A number composed of 3 primes, p_1, p_2, p_3, has 8 factors 1, p_1, p_2, p_3, (p_1p_2), (p_1p_3), (p_2p_3), $(p_1p_2p_3)$.

Since 3N has 5 factors, one of which is 3, 3N must be a power of 3, namely, $3^4 = 81$. Therefore N = 27.
Then 5N = 135 and the factors are 1, 3, 5, 9, 15, 27, 45, 135.
Answer: 5N has 8 factors

Problem No. 18

A 4-number combination lock uses the digits 1-9 without repetition as follows

The second digit is prime.

The sum of the third and fourth exceeds 10

The second and fourth digit differ by one

The first is 3 greater than the third

Exactly one digit is a perfect square.

What is the combination that will open the lock?

Describe fully how you arrived at your answer.

Solution to No. 18

2^{nd} digit prime: 2,3,5,7 => 4^{th}: 1,2,3,4,6,8 (2^{nd} ±1) => 3^{rd}: 3,4,5,6,7,8,9 and $4^{th} \neq 1$(3^{rd} + 4^{th} > 10).

1^{st} (3^{rd} +3): 6,7,8,9 => 3^{rd} (1^{st} – 3): 3,4,5,6 => 4^{th}: 6,8 (3^{rd} + 4^{th} > 10) => 2^{nd} (4^{th} ±1, prime): 5,7.

1^{st}: 6,7,8,9; 2^{nd}: 5,7; 3^{rd}: 3,4,5,6; 4^{th}: 6,8. Check for one square digit from 4, 9.

3^{rd} = 4 => 4^{th} is 8 (3^{rd} + 4^{th} >10) => 1^{st} is 7 (3^{rd} +3) and 2^{nd} is also 7 (4^{th} – 1); but no repeats allowed.

1^{st} = 9 => 3^{rd} is 6 (1^{st} – 3) => 4^{th} is 8 (3^{rd} + 4^{th} >10; repeat 6 not allowed) => 2^{nd} is 7 (4^{th} – 1). This satisfies all the requirements and gives the solution.

Answer: 9768

Alternative solution: The answer may be found by trial-and-error or by partial trial-and-error but it may not be enough to show that there are no other possibilities.

Alternative solutions: Diagrammatic methods:

	1^{st}	
2^{nd} prime	2^{nd}	2, 3, 5, 7
	3^{rd}	
2^{nd} & 4^{th} differ by 1	4^{th}	1, 2, 3, 4, 6, 8

1^{st} =3^{rd} +3	1^{st}	6, 7, 8, 9
	2^{nd}	
1^{st} – 3 3^{rd} +4^{th}>10;	3^{rd}	~~1~~, ~~2~~, 3, 4, 5, 6
4^{th} +3^{rd} >10	4^{th}	~~1~~, ~~2~~, ~~3~~, ~~4~~, 6, 8

	1^{st}	6, 7, 8, 9
2^{nd} & 4^{th} differ by 1	2^{nd}	~~2~~, ~~3~~, 5, 7
	3^{rd}	3, 4, 5, 6
	4^{th}	6, 8

Only one square number: 9 or 4

4(3^{rd})+3=7	1^{st}	~~6~~, 7, ~~8~~, ~~9~~
8(4^{th})-1=7	2^{nd}	~~5~~, 7
Start: Sq.4	3^{rd}	~~3~~, **4**, ~~5~~, ~~6~~
4(3^{rd})+8>10	4^{th}	~~6~~, 8

Disallowed since 7 repeats.

Start: Sq. 9	1^{st}	~~6~~, ~~7~~,~~8~~, **9**
8(4^{th})-1 = 7	2^{nd}	~~2~~, ~~3~~, ~~5~~, 7
9(1^{st}) -3=6	3^{rd}	~~3~~,~~4~~,~~5~~, 6
6(3^{rd}) +8>10; Not repeat 6	4^{th}	~~6~~, 8

Code 9768

OR

Only one square number: 9 or 4

Sq.:9 or 4(3^{rd})+3=7	1^{st}	~~6~~, 7, ~~8~~, 9
	2^{nd}	5, 7
Sq. 4 or 9(1^{st})-3=6	3^{rd}	~~3~~, 4, ~~5~~, 6
4^{th} +3^{rd} >10; no repeats	4^{th}	~~6~~, 8

No repeat 7	1^{st}	~~7~~, 9
8(4^{th})-1=7	2^{nd}	~~5~~, 7
9(1^{st})-3 = 6	3^{rd}	~~4~~, 6
Start with 8	4^{th}	**8**

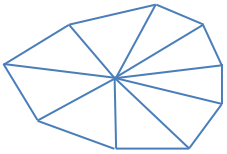
Code 9768

Problem No. 19

The sum of all the internal angles in an n-sided polygon (with no reflex angles) measures 1260 degrees. What is the value of n?

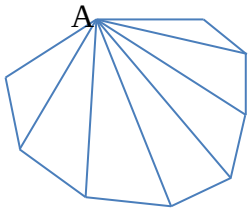
Solution to No. 19

An n-sided polygon supports n triangles at some common interior point. There will be $180n^o$ in these n triangles including 360^o at the common point. Thus, (1260 + 360)÷180 gives the number of triangles and hence the number of sides. 1260 + 360 = 1620.
Then, 1620÷180 = 9. The value of n is 9
Answer: 9



Alternative solution:

The internal angles add to 1260^o. Then, $\frac{1260}{180} = 7$.
The polygon may be split into 7 triangles using a vertex point, A, as a common vertex for the triangles (see diagram).
Thus, there are 7 triangle bases forming sides of the polygon plus 2 sides of triangles to complete the polygon.
The polygon has 9 sides. Answer: 9.



Problem No. 20

On a 9-hole golf course the hole lengths are 150m, 300m, 250m, 325m, 275m, 350m, 225m, 400m, 425m.
A golfer can learn to play only two strokes of different lengths which are played to exactly those lengths whenever played. If every stroke the golfer takes is directly in line with the hole, what two lengths should the golfer learn in order to minimise the number of strokes needed to complete all 9 holes?

Solution to No. 20

The least number of strokes may be found by allowing the golfer to overshoot the hole. Noting that all the hole-lengths are multiples of 25 and using a strategic search of combinations (starting from (50 and 25) and using increments of 25 in each) we can find the optimum lengths of strokes as follows:

Hole	Hole length (metres)	Stroke lengths 175m and 75m	Total no. of strokes	Stroke lengths 150m and 125m	Total no. of strokes
1	150	2(75)	2	1(150)	1
2	300	4(75)	4	2(150)	2
3	250	1(175) + 1(75)	2	2(125)	2
4	325	1(175) + 2(75)	3	3(150) – 1(125)	4
5	275	2(175) – 1(75)	3	1(150) + 1(125)	2
6	350	2(175)	2	4(125) – 1(150)	5
7	225	3(75)	3	3(125) – 1(150)	4
8	400	1(175) + 3(75)	4	1(150) + 2(125)	3
9	425	2(175) + 1(75)	3	2(150) + 1(125)	3
			26		26

Answer: Lengths (175m and 75m) or (150m and125m). Either combination was acceptable as the answer for the competition.

Problem No. 21
Number Search

1	2	1	1	8	0	5	4	7
2	9	9	7	9	2	1	0	7
4	1	0	2	5	8	5	3	4
7	6	7	0	3	2	4	2	3
1	6	8	0	6	2	4	0	1
9	6	5	9	4	3	5	7	6

ACROSS

a) 7^5-1

b) The year of the birth of William Rowan Hamilton

c) This year, Peter's Problem Competition begins on January 7th and all entries must be submitted by March 5th.
The number of days which may be taken to complete the challenge

d) The smaller non unit factor of 2021

e) The speed of light in km per second, to the nearest kilometre

f) $9(1 + 2\times7) - 6 \times 5 - 4^3 + 26$

DOWN

a) The larger non unit factor of 2021

b) The value of the Roman Numeral MDCLXVI

c) The number of lead in the Periodic Table of Elements

d) 8! (That is, 8 Factorial)

e) The flight distance in km between airports whose codes are DUB and SYD, correct to 3 significant figures.

f) 1024 to the power of $\frac{2}{5}$

Cross out the answer to each question as it is found on the grid. Each answer must eliminate at least one number not already eliminated.

What is the sum of the numbers not used in the Number Search?

Solution to No. 21 Number Search

									Unused total
1	**2**	**1**	*1*	*8*	*0*	*5*	*4*	**7**	**11**
2	*9*	*9*	*7*	*9*	*2*	**1**	*0*	**7**	**8**
4	*1*	0	*2*	*5*	*8*	**5**	*3*	**4**	**9**
7	*6*	*7*	*0*	**3**	*2*	**4**	*2*	**3**	**10**
1	*6*	*8*	*0*	*6*	**2**	**4**	*0*	*1*	**6**
9	*6*	**5**	**9**	*4*	*3*	**5**	**7**	*6*	**35**
								Total:	**79**

ACROSS

a) 7^5-1: 16806

b) The year of the birth of William Rowan Hamilton: 1805

c) This year, Peter's Problem Competition begins on January 7th and all entries must be submitted by March 5th.
The number of days which may be taken to complete the challenge: 58

d) The smaller non unit factor of 2021: 43

e) The speed of light in km per second, to the nearest kilometre: 299792

f) $9(1 + 2\times7) - 6 \times 5 - 4^3 + 26$: 67

DOWN

a) The larger non unit factor of 2021: 47

b) The value of the Roman Numeral MDCLXVI: 1666

c) The number of lead in the Periodic Table of Elements: 82

d) 8! (That is, 8 Factorial): 40320

e) The flight distance in km between airports whose codes are DUB and SYD, correct to 3 significant figures.: 17200

f) 1024 to the power of $\frac{2}{5}$: 16

What is the sum of the numbers not used in the Number Search? Answer: 79 (Digits shown in bold on a white background)

- Note: A clarification was sent for this question: The answers for Across are to be filled in from Left to Right
- The answers for Down are to be filled in from Top to Bottom
- The phrase 'each answer must eliminate at least one **number** not already eliminated' should read 'each answer must eliminate at least one **digit** not already eliminated'.
- The 'sum of the **numbers** not used in the Number Search' should read 'the sum of the **digits** not used in the Number Search'